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# Age at First Marriage of Women in Bangladesh: Levels, Trends and Determinants

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## Abstract

Age at first marriage is an important demographic event affecting births, deaths, and women's and children's health. This study aims to explore the levels, trends and determinants of age at first marriage of women in Bangladesh. This study utilized data from the 2014 Bangladesh Demographic and Health Survey. The univariate (some basic statistics), bivariate (simple cross-tabulation and  $\chi^2$ -test) and multivariate (analysis of covariance, multiple classification analysis and binary logistic regression) techniques were adopted to analyze the data. Age of women at first marriage in Bangladesh has been increasing over time, while the pace is sluggish. Respondent's education has a strong positive effect on age at marriage. Women with a higher level of education are more likely to get delayed marriage. Current age, religion, region, place of residence and husband's education are also influential factors affecting age at marriage. Wealth index is partially significant, that is, women from households with economically poor status are significantly more likely to marry early than those from affluent households. The change in age at marriage is associated with major social structural changes such as women's educational attainment and urbanization process.

**Keywords:** age at first marriage, Bangladesh, statistical methods

## 1. Introduction

Marriage is an important social institution, especially in a society like Bangladesh, where without marrying men and women cannot engage in sex and maintain their intimate sexual and familial relations [1–6]. This indicates that age at marriage is the prime issue to grow the marital relationship. Age at marriage symbols the transition to adulthood in many societies. It is the point at which certain options in education, employment, and contribution to society are prohibited and the initiation of regular exposure to the risks of pregnancy and childbearing [7]. Girls who marry early achieve lower education, have lower social status in their husbands' families, report less reproductive control, suffer higher rates of maternal mortality and morbidity, and experience domestic violence [8–14]. Early marriage is associated with poor sexual and reproductive health. Child brides are often inept to negotiate safe sex with their husbands, making them more vulnerable to sexually transmitted infections, including HIV, and putting them at higher risk of early pregnancy [15, 16]. Moreover, early married women have, on average, a longer

reproductive span leading to higher completed fertility and rapid population growth [9, 17, 18].

Conversely, women marrying after the age of 18 (called late marriage: authors' definition in the contexts of Bangladesh) can achieve a higher level of schooling, develop career interests and participate more in the workforce as skilled personnel. These achievements and interests may, in turn, stimulate women to limit family size or expand the spacing of birth [19, 20]. Late marriage reduces the period of childbearing, resulting in lower completed fertility. Several studies noticed that age at marriage associated with major structural changes in society [21–25]. For example, late marriage emerges in new roles for teenagers. Moreover, late married women experience relatively lower rates of malnutrition, isolation, and depression [26, 27] than women who marry early, in part due to intimate partner violence [28, 29].

Marriage is almost universal in Bangladesh. The country has one of the world's highest rates of early marriage [30]. Field [17] reported that more than 70% of first marriages occur within 2 years of menarche in Bangladesh. According to UNICEF [31], 52% of Bangladesh girls get married before their 18th birthday. The number is remarkably high yet. However, a significant decrease is perceived since 2000, when the amount was 65%. This indicates that Bangladesh has made some progress in reducing early marriage. The problem is, in the early 2017s, the government of Bangladesh passed a law that would allow for child marriage to occur in “special circumstances”. That is, with parental consent and with permission from the courts “the best interested of the underage female or male” can be married, while the minimum age at marriage (18 for women and 21 for men) did not change. This new child marriage law in Bangladesh may swing in the wrong direction.

The existing literature on marriage in Bangladesh focuses mainly on early/child marriage or on similar specific topics (see, [30, 32–45]). An overall discussion on age at first marriage in Bangladesh is available in [37]. Due to major social structural changes in Bangladesh, the current situation raises a question comprising a complete idea about the practice of marriage. This study aims to explore the levels, trends and determinants of age at first marriage of women in Bangladesh.

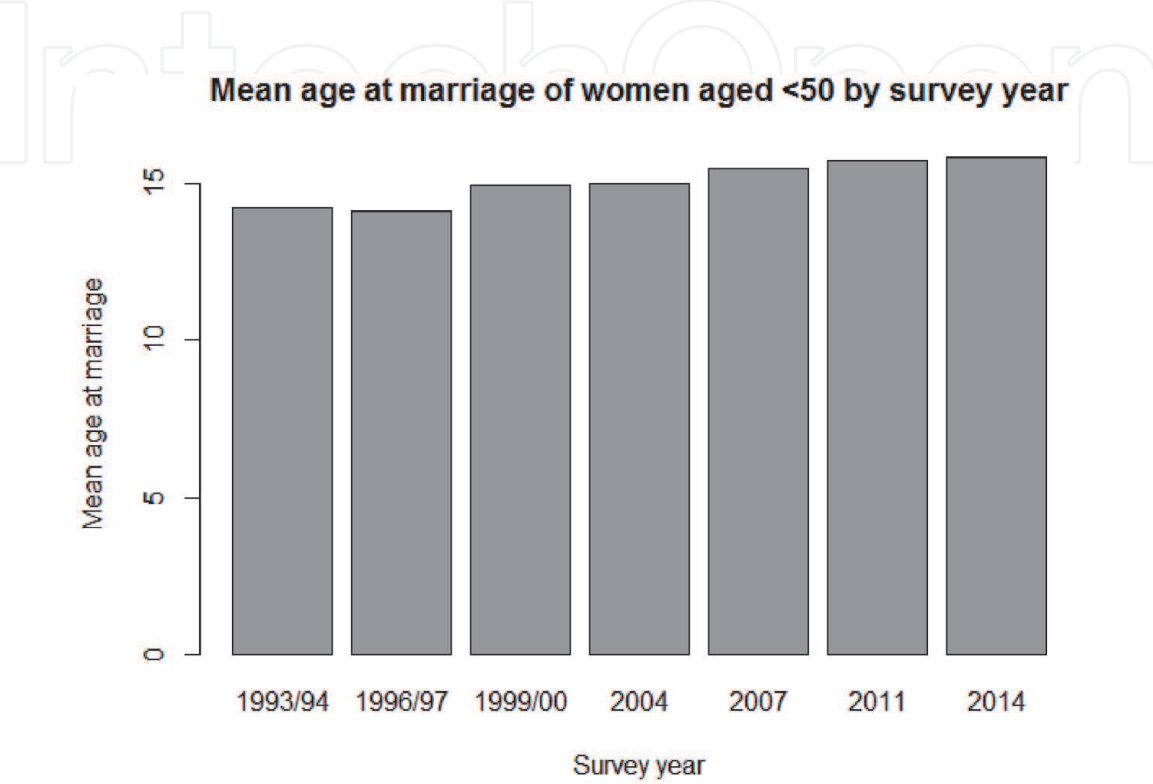
## 2. Levels and trends of age at marriage: BDHS 1993/94–2014

The Demographic and Health Survey (DHS) is a nationwide household survey in developing countries offering data for a wide range of monitoring and impact assessment indicators in the areas of population, health, and nutrition. Bangladesh is under the global DHS program. By 2014, the DHS has conducted seven surveys in Bangladesh, in 1993/94, 1996/97, 1999/2000, 2004, 2007, 2011, and 2014. In this section, all seven datasets are used to estimate the mean age at first marriage of women in Bangladesh. **Figure 1** represents the mean age at first marriage of women aged 15–49 years based on survey years from 1993/94 to 2014.

According to the first survey conducted in 1993/94, the mean age of women at first marriage was about 14.25 years; it was narrowly decreased in 1996/97 (about 14.16 years). Researchers claimed that 95% of girls' menarche happens at an average of  $13.5 \pm 1.0$  years of age [53, 54]. That is, until 1997, women got married around the age of puberty. The mean age at marriage was significantly increased, nearly 0.75 years, in 1999/2000. It was almost the same from 1999/2000 to 2004 (about 15 years). Later, it was increased about a half-year in 2007. This increasing trend has been continued and reached 15.86 years in 2014.

**Table 1** represents the percentage of never-married women by age groups, obtained from different (BDHS) surveys from 1993/94 to 2014. The proportion of

women who get late marriage will increase if the proportion of never-married women increases in consecutive surveys. It shows an increasing trend in the proportion of never-married women aged 15–19 in 1993/94–2014. With some fluctuations, this proportion has also been increased among women aged 20–24, 25–29 and 30–34 years. Overall, the proportion of never-married women has been increased over the years, while the amount of increase is not too high. Both **Figure 1** and **Table 1** designate that age at first marriage of Bangladeshi women has been slowly but steadily increasing.



**Figure 1.** Mean age at first marriage of women aged <50 by survey years, BDHS 1993/94–2014. Sources: 1993–1994 Bangladesh demographic and health survey (BDHS) [46]; 1996–1997 BDHS [47]; 1999–2000 BDHS [48]; 2004 BDHS [49]; 2007 BDHS [50]; 2011 BDHS [51]; 2014 BDHS [52].

Age	BDHS 1993–1994	BDHS 1996–1997	BDHS 2000	BDHS 2004	BDHS 2007	BDHS 2011	BDHS 2014
10–14	95.2	95.2	92.7	88.6	—	—	—
15–19	50.5	49.8	51.9	52.1	52.8	54.3	54.8
20–24	12.4	17.2	18.5	15.2	14.3	13.4	15.5
25–29	2.2	3.4	4.2	4.2	4.3	3.0	4.1
30–34	0.3	0.5	0.1	1.2	0.6	1.2	1.2
35–39	0.3	0.0	0.2	0.4	0.6	0.8	0.8
40–44	0.7	0.0	0.0	0.3	0.2	0.3	0.6
45–49	0.2	0.0	0.0	0.0	0.8	0.2	0.2

Sources: 1993–1994 Bangladesh Demographic and Health Survey (BDHS) ([46]:72); 1996–1997 BDHS ([47]:82); 1999–2000 BDHS ([48]:78); 2004 BDHS ([49]:93); 2007 BDHS ([50]:77); 2011 BDHS ([51]:49; 2014 BDHS ([52]:40).

**Table 1.** Percentage of never married women in Bangladesh by current age, BDHS 1993–2014.

### 3. Data, variables and methods

#### 3.1 Source of data

This study uses the data from the Bangladesh Demography and Health Survey (BDHS) conducted in 2014. BDHS is a nationally representative and retrospective survey, collected information on marriage, fertility, family planning, maternal and child health, and information about HIV/AIDS. A total of 17,863 ever-married women aged 15–49 were successfully interviewed. Of those, this study engaged women who are 20 or higher ages. That is, this study considered a sample of size 15,840. A detailed description of the survey is available in the report book, prepared by the Ministry of Health and Family Welfare's National Institute of Population Research and Training [52].

#### 3.2 Variables and methods

“Age at first marriage” is the dependent variable in this study. It is reported by ever-married women during the survey and measured in terms of completed years. In **Table 1**, over 50% of women aged 15–19 had never married. Thus, women aged 15–19 are not included in this study as they may give a bias result. The explanatory variables (covariates) are chosen based on existing literature on age at marriage of women in Bangladesh and other developing countries and the availability of data. The covariates are current age (20–29, 30–39 and 40–49), religion (Muslim and non-Muslim), place of residence (urban and rural), region of residence (Barisal, Chittagong, Dhaka, Khulna, Rajshahi, Rangpur and Sylhet), respondent's and husband's education (illiterate, primary, secondary and higher secondary), wealth index (poor, middle and rich) and access to mass media (no access and has access). It should be noticed that access to mass media is the combination of three factors such as frequency of reading newspaper, listening to radio and watching TV.

This paper reviews the use of descriptive statistics to describe the age at first marriage of women aged 20 or more. The chi-square test for independence of attributes is applied to observe the association between age at marriage and each of selected covariates. To identify the determinants of age at marriage and to assess the effects of determinants more splendidly, the analysis of covariance (ANCOVA) and multiple classification analysis (MCA) techniques are sequentially employed to the data. Finally, a binary logistic regression technique is applied to inspect the accountability of covariates to early/late marriage. This technique is repeated three times. Model 1 includes the current age only. Model 2 is used to obtain the net effect of current age on age at marriage after controlling all other covariates. Model 3 is used to examine the effect of education on age at marriage over time.

### 4. Results

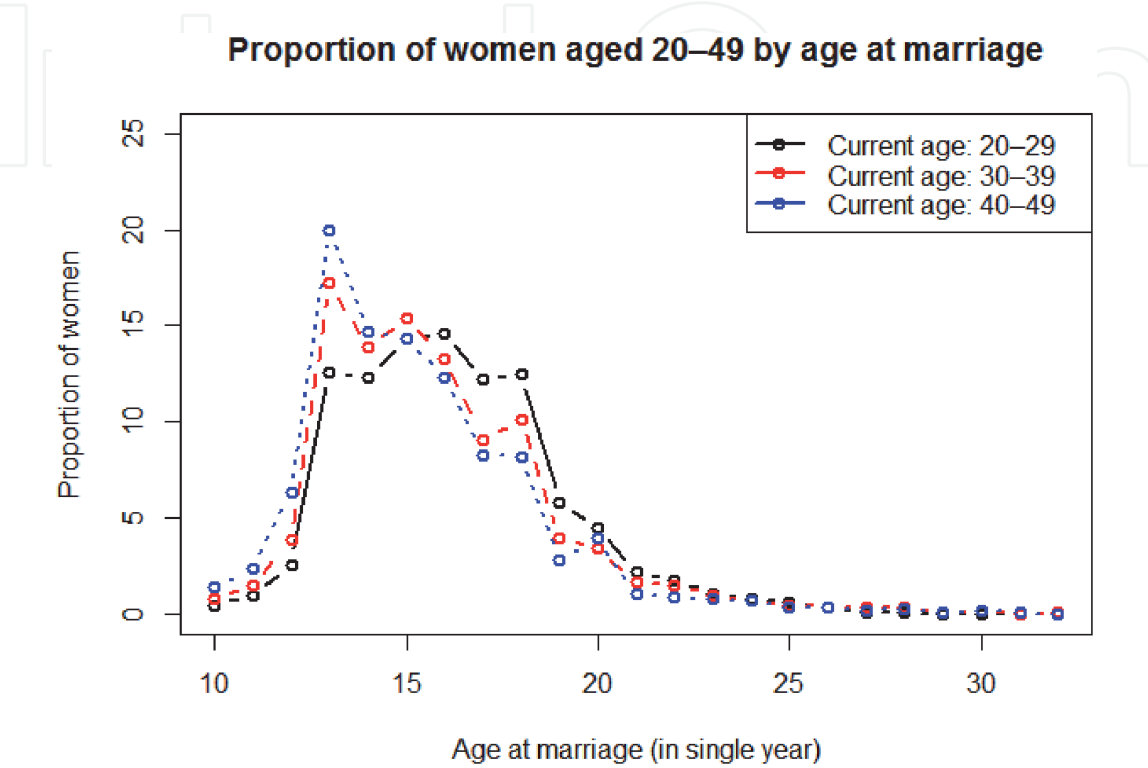
#### 4.1 Trends in age at marriage of women aged 20–49: Univariate analysis

**Table 2** represents some descriptive statistics of age at first marriage of women ages 20–29, 30–39 and 40–49 years. The modal value ( $Mo$ ) exposes that the prevalence of marriage among women aged 30 or more is the highest at age 13 and that of women aged 20–29 is 16. Besides, the values of mean ( $\bar{X}$ ), median ( $Me$ ), first quartile ( $Q_1$ ) and third quartile ( $Q_3$ ) indicate that women aged 20–29 are rather delayed married than women aged 30 or more.



Age at survey (in years)	$\bar{X}$	Me	Mo	$Q_1$	$Q_3$	SD	$\beta_1$	$\beta_2$	$N$
20–29	16.25	16	16	14	18	2.80	0.80	1.01	6504
30–39	15.91	15	13	14	17	3.24	1.66	4.94	5352
40–49	15.46	15	13	13	17	3.24	2.12	10.27	3984

**Table 2.**  
Descriptive statistics of age at first marriage of women by current age, BDHS 2014.



**Figure 2.**  
Proportion of women aged 20–49 based on age at marriage, BDHS 2014.

The values of  $\beta_1$  and  $\beta_2$  in **Table 2** and the curves in **Figure 2** assign that the frequency distribution of age at first marriage of women for all three age groups/cohorts is positively skewed, while the curve obtained by the younger cohort (women aged 20–29) is less skewed than that of older cohorts (women aged 30–39 and 40–49). That means the practice of early marriage among the younger cohort is not as frequent as in older cohorts.

#### 4.2 Differentials of age at marriage of women aged 20–49: Bivariate analysis

The legal age of women at first marriage is 18 years in Bangladesh, while the parliament of government has approved a new law called ‘Child Marriage Restraint Act 2017’, which allows girls under 18 to marry through parental consent and with permission from the courts. Hence, women marrying at age 18 or later is called the mature or late marriage. The response variable ‘age at first marriage’ is classified as  $<18$  and  $\geq 18$  years to observe the prevalence of late/early marriage among women aged 20–29, 30–39 and 40–49 by some selected covariates. The  $\chi^2$ -test for independent of attributes (results are not shown) suggests that the covariates are significantly associated with age at marriage. **Table 3** represents the percentage and the mean difference of nuptial age among women aged 20–29, 30–39 and 40–49 years.

Covariates	Percentage at marriage of women age			Mean age at marriage of women age			Increase in mean age	
	20–29	30–39	40–49	20–29	30–39	40–49		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) = (5)–(6)	(9) = (6)–(7)
<i>Religion</i>								
Muslim	29.2	23.6	18.7	16.18	15.80	15.31	0.38	0.49
Non-Muslim	36.4	35.2	33.8	16.93	16.84	16.65	0.09	0.19
<i>Region of residence</i>								
Barisal	28.4	21.4	18.3	16.19	15.73	15.42	0.46	0.31
Chittagong	35.6	29.2	24.2	16.74	16.11	15.77	0.63	0.34
Dhaka	32.5	28.9	22.4	16.38	16.15	15.61	0.23	0.54
Khulna	22.8	18.7	15.9	15.77	15.49	15.00	0.28	0.49
Rajshahi	21.3	20.9	14.1	15.72	15.60	14.95	0.12	0.65
Rangpur	21.6	17.8	15.3	15.56	15.44	15.01	0.12	0.43
Sylhet	44.9	36.5	36.7	17.29	16.87	16.86	0.42	0.01
<i>Type of place of residence</i>								
Rural	26.3	20.6	16.4	16.00	15.56	15.08	0.44	0.48
Urban	36.6	33.0	27.5	16.72	16.57	16.14	0.15	0.43
<i>Respondent's education</i>								
Illiterate	19.6	13.0	13.6	15.27	14.83	14.75	0.44	0.08
Primary	19.1	16.4	16.4	15.42	15.10	15.04	0.32	0.06
Secondary	29.2	30.4	29.1	16.30	16.45	16.45	–0.15	0.00
Higher secondary	75.5	80.4	77.6	19.55	21.00	21.22	–1.45	–0.22
<i>Husband's education</i>								

Covariates	Percentage at marriage of women age			Mean age at marriage of women age			Increase in mean age	
	20–29	30–39	40–49	20–29	30–39	40–49		
Illiterate	18.2	14.0	13.6	15.35	14.96	14.75	0.39	0.21
Primary	22.2	18.4	15.7	15.72	15.28	15.02	0.44	0.26
Secondary	31.9	28.7	21.6	16.38	16.18	15.61	0.20	0.57
Higher secondary	58.4	55.6	47.5	18.44	18.84	18.18	–0.40	0.66
<i>Access to mass media</i>								
No	20.7	16.9	13.8	15.60	15.22	14.85	0.38	0.37
Yes	34.3	29.7	25.3	16.57	16.34	15.92	0.23	0.42
<i>Wealth index</i>								
Poor	18.8	15.9	13.9	15.50	15.18	14.80	0.32	0.38
Middle	30.5	22.5	17.6	16.23	15.66	15.16	0.57	0.50
Rich	47.4	43.1	35.8	17.58	17.50	17.06	0.08	0.44
Total	29.8	24.8	20.4	16.25	15.91	15.46	0.34	0.45

**Table 3.**  
*Percentage and mean age at first marriage of women aged 20–49 years by socio-cultural factors, BDHS 2014.*



Considering few exceptions, the practice of delayed marriage by each covariate is more prevalent among women aged 20–29 than those who are aged 40–49 and 30–39 as well. Overall, the prevalence of marriage at 18 or later ages is about 30%, 25% and 20% among women aged 20–29, 30–39 and 40–49, respectively.

When age at first marriage of women is assessed by religion, it shows that non-Muslims delays 0.75 years or more to get married than their Muslim counterparts. In Muslims, the mean age at marriage is highest for women aged 20–29 (16.18 years), followed by women aged 30–39 (15.80 years) and 40–49 (15.38 years), respectively. The corresponding mean values for non-Muslim women aged 20–29, 30–39, and 40–49 are closed to each other.

Age at marriage varies across regions (divisions) in Bangladesh. In any region, the mean age at marriage is highest for women aged 20–29, followed by women aged 30–39 and 40–49, respectively. The difference in mean nuptial age between women in the first two age groups is substantially high in Chittagong (0.63 years) and Barisal (0.46 years) divisions. The corresponding difference between women in the last two age groups is also high in Rajshahi (0.65 years), Khulna (0.54 years) and Dhaka (0.49 years) divisions. In all three cases, the mean age at marriage is highest in Sylhet, which is 1.43 years or more higher than that of Rangpur division. The second-largest mean age at marriage is found in Chittagong, subsequently in Dhaka and Barisal divisions.

A notable variation in the mean nuptial age is shown when women are classified by place of residence. In rural areas, mean ages of marriage among women aged 20–29, 30–39 and 40–49 are 16.00, 15.56 and 15.08 years, respectively. In urban areas, the mean age at marriage among women aged 20–29 is 16.72 years, which is slightly higher than that of women aged 30–39 (16.57 years) and notably higher than women aged 40–49 (16.14 years).

Respondent's educational attainments have a significant positive relation to age at first marriage. The average age at marriage among women aged 20 or more with higher secondary education is much higher than the legal age at marriage. It shows that higher secondary school graduates marry, on average, three or more years later than those who are secondary school graduates and four or more years later than those who have no education. The average age at marriage among women with primary education is not too distinct from women with no education. Of all three age groups, women aged 20–29 with no or primary education have the highest mean age at marriage (15.27 and 15.42 years, respectively), while they with secondary or higher secondary education have the lowest mean age at marriage (16.30 and 19.55 years). The opposite is true for women aged 40–49.

The impact of husband's education on age at marriage is not as strong as female education. With an exception (e.g., women aged 20–29 marrying to the men with higher secondary education), the highest mean age at marriage is found among women aged 20–29, followed by women aged 30–39 and 40–49, marrying to the men having no or have any education. Women marrying to the men with higher secondary education marry, on average, three or more years later than those marrying to the men with no education.

Access to mass media seems to play some role in increasing the age at marriage. Mass media exposures marry, on average, about one or more years later than their non-exposure counterparts. Among non-exposures, the highest mean age at marriage is found among women aged 20–29 (15.60 years), followed by the women aged 30–39 (15.22 years) and 40–49 (14.85 years), respectively. A similar pattern is seen among exposure groups.

Wealth index may have an impact on age at marriage. Women from poor households marry, on average, two or more years earlier than those from rich households. In poor communities, women aged 20–29 marry on average 0.32 years later than the

Source of variation	Sum of squares	df	Mean square	F-test	p-value	Partial $R^2 \times 100$
<i>Covariates</i>	1885.59	2	942.79	145.56	0.000	—
Age	274.30	1	274.30	42.35	0.000	1.05
Age squared	1611.28	1	1611.28	248.77	0.000	0.89
<i>Factors</i>	39353.49	17	2314.91	357.41	0.000	—
Religion	968.63	1	968.63	149.55	0.000	0.69
Region of residence	6218.19	6	1036.37	160.01	0.000	0.24
Place of residence	116.40	1	116.40	17.97	0.000	0.12
Respondent's education	30716.64	3	10238.88	1581	0.000	4.32
Husband's education	1246.33	3	415.44	64.14	0.000	0.67
Access to mass media	11.26	1	11.26	1.74	0.187	0.05
Wealth index	76.05	2	38.03	5.87	0.003	0.27
Model	41239.08	19	2170.48	335.11	0.000	
Residual	115568.19	17843	6.48			
Total	156807.27	17862	8.78			

Note:  $\beta(\text{age}) = -0.013$ ,  $\beta(\text{age-squared}) = -0.004$ . df means degrees of freedom.

**Table 4.**  
Hierarchical analysis of covariance of age at first marriage and selected variables, BDHS 2014.

women aged 30–39 (15.18 years) and 0.70 years later than women aged 40–49 (14.80 years). It is also true for women belonging to the middle and rich class.

4.3 Determinants of age at marriage

Differentials in age at marriage across levels of explanatory variables have been presented using simple cross-tabulations. To the point of determinants of age at marriage, these simple tabulations represent only part of the results [36]. Indeed, an assessment of the effect of a variable on age at marriage endures difficulties arising from the impact of other variables that might be correlated. The multivariate treatment of the data can suitably be used to extract the effect of each of inter-correlated variables on the dependent variable. Hence, an ANCOVA technique is employed to examine the effect of explanatory variables on age at marriage. All selected covariates produce a total of 21 two-way interaction terms. Only two of them are found to be significant at 1% level of significance but they contribute negligibly (below 0.005) to the squared multiple correlation coefficients. Hence, the interaction terms are avoided from the final model.

The variables involved in the model are introduced into the ANCOVA hierarchically. Age and age-squared—a function of age, are treated as covariates since age is a continuous variable. The variable age-squared is accessed into the model owing to possible curvilinearity of age at marriage by the respondent’s current age. The beta ( $\beta$ ) coefficient of age-squared, computed from the ANCOVA technique, is negative (−0.004), which is a symptom of convexity in the relationship. The sequence of the variables in the model is the same as is shown in **Table 4**. Following the ANCOVA, MCA is carried out to examine the effect of independent variables on age at marriage and to briefly interpret them.

**Table 4** represents the results of the hierarchical analysis. The analysis indicates a total of 8.30% variation for all the variables under consideration. Only the age variable explains 1.05% of the variation. The regression coefficient of age (−0.013) exhibits an inverse relationship between age at marriage and current age. That is, women of higher ages marry earlier in life than younger women, indicating a successive increase in age at marriage. The negative beta coefficient of age-squared confirms a curvilinear negative relationship with age at marriage. The value of partial  $R^2 = 0.89$  signifies that the variable is relatively less powerful than the current age. After controlling for age and age-squared, religion explains a considerably large proportion of variation (0.69). Region of residence demonstrates a significant relationship with age at marriage. It explains only 0.24% of total variation after controlling for age, age-squared and religion. Place of residence explains the smallest amount of variation (0.12), when controlled for region of residence with the preceding three variables. Respondent’s education has the largest net effect on age at marriage of all independent variables. It contributes 4.32% of total variation even after controlling for five variables such as age, age-squared, religion, region of residence and place of residence. The variation explained by husband’s education is 0.67%. Husband’s education as a predictor of age at marriage is weaker than female education. The amount of variation explained by access to mass media is almost negligible (0.05%). The influence of wealth index is significant, contributing 0.27% of variation to the total, when controlled for age, age-squared, religion, region of residence, place of residence, access to mass media, female and husband’s education.

The results obtained by MCA are shown in **Table 5**. The unadjusted mean age at marriage for Muslims and non-Muslims indicates the expected pattern. It is higher for non-Muslims. However, the difference in mean age at marriage between

Covariates	No. of respondents	Unadjusted	Adjusted
<i>Religion (<math>\eta = 0.095, \beta = 0.080</math>)</i>			
Muslims	16135	15.77	15.78
Others	1728	16.72	16.58
<i>Region of residence (<math>\eta = 0.173, \beta = 0.197</math>)</i>			
Barisal	2142	15.75	15.65
Chittagong	2865	16.23	16.22
Dhaka	3093	16.02	15.95
Khulna	2581	15.42	15.38
Rajshahi	2512	15.40	15.41
Rangpur	2531	15.32	15.31
Sylhet	2139	16.92	17.18
<i>Type of place of residence (<math>\eta = 0.133, \beta = 0.021</math>)</i>			
Rural	11696	15.57	15.81
Urban	6167	16.40	15.95
<i>Respondent's education (<math>\eta = 0.446, \beta = 0.378</math>)</i>			
Illiterate	4206	14.88	14.99
Primary	5495	15.19	15.32
Secondary	6778	16.15	16.12
Higher secondary	1384	20.04	19.38
<i>Husband's education (<math>\eta = 0.351, \beta = 0.110</math>)</i>			
Illiterate	5153	14.99	15.57
Primary	4894	15.37	15.69
Secondary	5379	16.04	15.96
Higher secondary	2437	18.26	16.57
<i>Access to mass media (<math>\eta = 0.161, \beta = 0.012</math>)</i>			
No	6593	15.23	15.81
Yes	11270	16.22	15.88
<i>Wealth index (<math>\eta = 0.264, \beta = 0.024</math>)</i>			
Poor	6611	15.19	15.87
Middle	7390	15.71	15.78
Rich	3862	17.28	15.97

**Table 5.**  
*Results of multiple classification analysis (MCA) of age at first marriage of ever married women, BDHS 2014.*

Muslims and non-Muslims narrows to 0.88 years obtained by adjusted from 0.95 years by unadjusted. This is also true for the remaining variables, except for region of residence. That means the multivariate adjustment of data reduces the difference in mean age at marriage among categories of each covariate. The difference between eta ( $\eta$ ) and beta ( $\beta$ ) values corresponding to religion is 0.015. That is, there is no inter-correlation between religion and other predictors. The difference in mean age at marriage across regions is found to be the maximum of 1.6 years when it is computed from Sylhet (16.92 years) to Rangpur (15.32 years)

Covariates	Model 1		Model 2		Model 3	
	OR	95% CI	OR	95% CI	OR	95% CI
Constant	0.26 <sup>a</sup>	—	0.07 <sup>a</sup>	—	0.08 <sup>a</sup>	—
<i>Religion</i>						
Muslim (RC)			1.00	—	1.00	—
Non-Muslim			1.71 <sup>a</sup>	1.51–1.94	1.77 <sup>a</sup>	1.56–2.00
<i>Region of residence</i>						
Barisal			1.36 <sup>a</sup>	1.15–1.61	1.38 <sup>a</sup>	1.17–1.64
Chittagong			2.26 <sup>a</sup>	1.94–2.64	2.13 <sup>a</sup>	1.83–2.48
Dhaka			1.95 <sup>a</sup>	1.67–2.28	1.86 <sup>a</sup>	1.59–2.16
Khulna			1.09	0.93–1.29	1.08	0.92–1.27
Rajshahi			1.09	0.92–1.30	1.08	0.91–1.27
Rangpur (RC)			1.00	—	1.00	—
Sylhet			4.46 <sup>a</sup>	3.81–5.23	4.20 <sup>a</sup>	3.60–4.91
<i>Place of residence</i>						
Rural (RC)			1.00	—	1.00	—
Urban			1.14 <sup>a</sup>	1.04–1.25	1.15 <sup>b</sup>	1.05–1.26
<i>Respondent's age</i>						
20–29	1.66 <sup>a</sup>	1.51–1.82	1.16 <sup>b</sup>	1.04–1.29		
30–39	1.29 <sup>a</sup>	1.17–1.42	1.07	0.96–1.20		
40–49 (RC)	1.00	—	1.00	—		
<i>Access to mass media</i>						
No (RC)			1.00	—		
Yes			1.10 <sup>c</sup>	0.99–1.22	1.15 <sup>b</sup>	1.04–1.28
<i>Wealth index</i>						
Poor (RC)			1.00	—	1.00	—
Middle			1.06	0.95–1.18	1.08	0.97–1.20
Rich			1.06	0.92–1.23	1.19 <sup>c</sup>	1.03–1.37
<i>Respondent's education</i>						
No education (RC)			1.00	—		
Primary			1.18 <sup>a</sup>	1.04–1.33		
Secondary			1.92 <sup>a</sup>	1.67–2.20		
Higher secondary			13.36 <sup>a</sup>	10.83–16.49		
<i>Husband's education</i>						
No education (RC)			1.00	—	1.00	—
Primary			1.10	0.97–1.23	1.17 <sup>b</sup>	1.04–1.32
Secondary			1.41 <sup>a</sup>	1.25–1.61	1.62 <sup>a</sup>	1.44–1.83
Higher secondary			1.91 <sup>a</sup>	1.62–2.25	2.82 <sup>a</sup>	2.42–3.28
<i>Interaction terms</i>						
Primary × 20–29					1.11	0.97–1.28
Secondary × 20–29					1.52 <sup>a</sup>	1.36–1.70



Covariates	Model 1		Model 2		Model 3	
	OR	95% CI	OR	95% CI	OR	95% CI
Higher secondary× 20–29					7.84 <sup>a</sup>	6.37–9.65
Primary× 30–39					0.94	0.81–1.10
Secondary× 30–39					1.45 <sup>a</sup>	1.26–1.65
Higher secondary× 30–39					9.37 <sup>a</sup>	7.17–12.24
–2log likelihood	17957.6		15242.9		15452.7	
Chi-square	120.2		2834.9		2625.1	
Degrees of freedom	2		19		20	
R <sup>2</sup>	0.008		0.164		0.153	
Adjusted R <sup>2</sup>	0.011		0.241		0.224	

Notes: RC stands for reference category, OR indicates odds ratio and CI means confidence interval.  
<sup>a</sup>*p* < 0.001.  
<sup>b</sup>*p* < 0.01.  
<sup>c</sup>*p* < 0.05.

**Table 6.**  
*Binary logistic regression modeling on age at first marriage of women aged 20–49 years by socio-economic factors, BDHS 2014.*

regions. The statistical adjustment increases this difference, which is 1.87 years. As before, the values of  $\eta = 0.173$  and  $\beta = 0.197$  are close to each other, meaning no inter-correlation of region of residence with other predictors. Usually, urban women have a higher mean age at marriage than their rural counterparts. However, the adjustment largely reduces the difference of 0.14 from 0.83. A larger gap between  $\eta = 0.133$  and  $\beta = 0.021$  indicates an inter-correlation of place of residence with other predictors.

Respondent’s education remains the highest predictive capacity even when adjusted for other variables ( $\eta = 0.446$  and  $\beta = 0.378$ ). The adjustment holds the expected patterns: women with secondary or higher levels of education have a higher mean age at marriage than those who are illiterate. The effect of husband’s education is not as pronounced as respondent’s education. The beta value ( $\beta = 0.110$ ) reduces to more than one-third of the eta value ( $\eta = 0.351$ ), demonstrating an inter-correlation of this variable with other predictors. In the case of mass media and wealth index, the adjusted with respect to the unadjusted mean age at marriage differences are extremely small. Poor women and the women who have no contact with mass media have a lower mean age at marriage. A larger difference between eta and beta values indicates that mass media and wealth index are inter-correlated with other predictors.

**4.4 The prevalence of legal age at marriage**

According to the report in Section 2, the mean age at marriage of Bangladeshi women is far below the legal age for marriage. Hence, along with determining the determinants of age at marriage, it is crucial to review their accountability for early/late marriage. In case of that, the response variable ‘age at first marriage’ is considered as a categorical variable say *Y*, which takes two values 0 and 1. A value of ‘0’ includes women marrying before 18, and ‘1’ includes those marrying 18 or later ages. Based on the composition of *Y*, a binary logistic regression method can suitably be used to examine the effect of factors associated with a higher age at



marriage. The results obtained by the logistic regression method are shown in **Table 6**. The odds ratio (OR) is a relative measure of a specific category of a factor relative to the reference category of that factor. Model 1 includes only the current age of women; it estimates the amount of change in the chance of marrying 18 or later ages over time. Before carrying out the logistic regression method for Model 2, the Variance Inflation Factor (VIF) is used for checking multicollinearity among the independent variables. If the VIF value lies in 1–10, then there is no multicollinearity and if the  $VIF < 1$  or  $VIF > 10$ , then there is multicollinearity. The independent variables in this study do not suffer from multicollinearity problems as the values of VIF lie between 1 and 2 (results are not shown). All selected factors used in MCA are included in Model 2. The inclusion of other factors weakens the predicting power of current age on delayed marriage. Model 3 represents the interaction effect between respondent's education and current age and the main effect of the rest of the factors.

In **Table 6**, the values of log-likelihood and the associated  $\chi^2$  indicate that all three models are statistically significant. With respect to Model 1, Model 3 is better fitted due to the inclusion of interaction terms. Model 1 shows that the chance of marrying 18 or later ages significantly decreases with the increase of age. For example, the OR of the reference category (women aged 40–49) is 1.00, which gradually goes up to 1.66 for women aged 20–29, while after controlling all selected factors, it becomes 1.16 (see Model 2). Compared with Muslim, non-Muslim women are significantly more likely to marry 18 or later ages (OR = 1.71 in Model 2 and 1.77 in Model 3).

Among regions, the OR is highest in Sylhet (4.46 in Model 2 and 4.20 in Model 3), followed by Chittagong (2.26 and 2.13), Dhaka (1.95 and 1.86) and Barisal (1.36 and 1.38) respectively. In both models, urban women have a significantly higher OR than rural women. The OR is somewhat higher for women who have any contact (1.10 in Model 2 and 1.15 in Model 3) than those who have no contact with mass media. According to Model 3, wealth index affects partially the age at marriage. For instance, women from rich households are 1.19 times more likely to marry 18 or later ages than women from poor households.

Respondent's education is one of the most important factors affecting the age at marriage. In Model 2, women with higher secondary education obtain an incredibly higher OR, which is 13.36 times higher than that of women with no education. Moreover, the OR for women with secondary education is about two times of reference category.

Husband's education has also a significant impact on age at marriage. The OR obtained by Model 2 is substantially higher for women who marry to the men with a higher level of education. For instance, women marrying to the men with secondary education or with higher secondary education are 1.41 and 1.91 times more likely to marry 18 or later ages than those belonging to the reference category. Model 3 provides a similar trend with relatively larger ORs.

Most of interaction terms between current age and respondent's education are significant. The effect of education on age at marriage varies from one to another age group. The OR increases with increasing the level of education. The OR for women aged 20–29 with secondary education is 1.52 and with higher secondary education is 7.84. The corresponding ORs for women aged 30–39 are 1.45 and 9.37 respectively.

## 5. Discussions

According to survey years, age at first marriage of women in Bangladesh has been increased between 1993 and 2014. Additionally, the analyses by respondent's

current age demonstrate that women are in transition regarding age at marriage. For instance, younger women (aged 20–29 years) were more likely to get delayed marriage than those who are higher ages (e.g., women 30–39 and 40–49 years). It may be partly accredited to younger women with higher educational attainment compared with their older counterparts. These findings are consistent with those of earlier studies conducted on Bangladeshi women [37, 38, 55] and the women of Nepal and sub-Saharan Africa [56, 57].

The association between education and age at marriage is evident from almost all demographic research. Several studies [9, 17, 44, 45, 58] claimed that illiteracy is the prime cause in explaining the high frequency of early marriage in Bangladesh. A study on Nepali women has shown that each additional level of education beyond primary schooling substantially reduces the likelihood of early marriage [59]. The current study also finds similar results. Usually, women with a higher level of education spend a longer span of life in education, have a higher occupational aspiration and want to have a prestigious job. All these attainments delay the nuptial age [40]. It is also noteworthy to mention that women with a higher level of education get importance in taking decision on family matters. Thus, they have better bargaining power in getting delayed marriage and selecting their groom. Husband's education is also influencing age at marriage. Women who marry to the men with a higher level of education are higher likely to delayed marriage.

Religious beliefs and attitudes have a fixed and wide-reaching force in human culture. However, such values are distinctive between religious traditions. The higher prevalence of early marriage among Muslims reflects their traditional beliefs and practices. Previous studies conducted in Bangladesh or somewhere else [30, 55, 60, 61] also noticed that Muslim women marry earlier than their non-Muslim counterparts.

Distinct culture across regions possibly has an impact on age at marriage. In general, women in the north-west places of Bangladesh (Rangpur, Rajshahi, and Khulna) marry early. It may be because people in these regions are mostly poor, illiterate and adherent of traditional culture [30]. Women from other regions, especially in Sylhet and Chittagong, are more submissive to follow the marriage law in Bangladesh. One possible reason is that there are various tribal communities in Sylhet and Chittagong regions and the mean age at marriage of tribal women is four years higher than other Bangladeshis [62]. Moreover, as a port city, people in Chittagong are in an advantageous position to engage in business and service professions, resulting in getting delayed marriage. Also, for better earnings, many young people from Sylhet migrate to the Middle East and Europe, especially in the UK [63], which propels them to get delayed marriage.

Not likely the region of residence, but place of residence also partakes in explaining the socialization process. It shows that people in rural areas are under-privileged in terms of their educational attainment, economic status, social and cultural norms. Hence, age at marriage differs in rural–urban settings. In harmony with previous studies on Bangladeshi women and women in other developing countries, this study observed that women in rural areas are inclined to reflect the more conventional behavior of early marriage [30, 38, 40, 55, 60].

Mass media, a very different form of socialization than any other, affects individuals' thoughts, attitudes, and behavior. In line with an earlier study in Bangladesh [30], this study has found a positive relationship between age at marriage and exposure to mass media. Women who have any exposure to mass media are less likely to marry early than their non-exposure group.

Wealth Index is a composite measure of cumulative living standard of the household. Consistent with a previous study on 35 countries in Sub-Saharan Africa [64], this study has found a relationship between wealth index and age at marriage.

For instance, economically poor women are significantly more likely to marry early than those who are rich. However, there is no significant difference in the likelihood to get early/late marriage between women in poor class and women belonging to the middle class of economy.

## **6. Conclusion**

The mean age at marriage by survey years as well as by women's in three age groups indicate that the prevalence of early marriage among women in Bangladesh has been decreasing with time. However, the pace is too slow or even slower than other South Asian countries like Bhutan (22.8 years), India (22.2 years), Maldives (21.6 years), Nepal (17.9 years), Pakistan (20.3 years) and Sri Lanka (23.8 years). From a recent document, Bangladesh ranks 1st in Asia and 4th in the world in terms of child marriage. While the Child Marriage Restraint Act 1929 has been abolished by the act of 2017 preserving article 2 of the previous statute: the legal age for marriage for a girl 18 and for a boy 21, scholars and social scientists deem that the special provision added in the article 19 of 2017 child marriage restraint act will not encourage to decrease child marriage in Bangladesh. In fact, no laws or acts against child marriage will effectively work until people are cognizant about the devastating impacts of child marriage at individual, family and social levels. Awareness among mass people basically grows from the improvement of socio-economic and cultural factors.

This study shows that an increase in age at marriage is associated with major structural changes in society. Female education performs as a leading factor in this changing pattern. A strong positive relationship between respondent's education and age at marriage recommends increasing both the rate and level of female education. It could be the most effective way to advance the nation and women at the individual level. It is noteworthy to mention here that there are various government projects to promote the education of children in Bangladesh. Of those, free education for girls up to grade 10 and stipends for female students are two important projects that should be continued until confirming that no girl in Bangladesh will be married before achieving a minimum secondary school education, resulting in rapidly declining early marriage.

## **7. Strengths and limitations**

This study has several strengths. Firstly, it is based on a nation-wide survey dataset and also a general discussion on age at first marriage of women in Bangladesh. Secondly, an increasing trend in age at marriage has been observed in several ways. Lastly, various advanced as well as sophisticated statistical tools are used to identify the factors associated with and their effects on age at marriage. It is therefore deemed that the findings are more accurate.

Conversely, this study has some limitations. It is based on secondary data that contain no or few information on the respondent's family background. As girls marry early, all antecedents relate to their family of origin (parents decide). Moreover, it is assumed that the number of women at the time of interview is the same as that of women at the time of first marriage. However, some of covariates, especially place of residence may somewhat deviate from this assumption as people tend to migrate from rural to urban areas for better livelihood. Hence, the results corresponding to place of residence may be biased to some extent. Better data collection may expose all potential factors relating to early marriage and provide accurate findings on age at marriage in Bangladesh.

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## References

- [1] Alam AZM. Family Values. Dhaka: Bangladesh Cooperative Society Limited; 1995
- [2] Aziz KMA. Kinship in Bangladesh. Dhaka: International Centre for Diarrhoeal Disease Research, Bangladesh; 1979
- [3] Maloney C, Aziz KMA, Sarker PC. Beliefs and Fertility in Bangladesh. Dacca: International Centre for Diarrhoeal Disease Research, Bangladesh; 1981
- [4] Sarker PC. Social Structure and Fertility Behaviour: A Cross-Cultural Study. Dhaka: Centre for Development Services; 1997
- [5] Tessema B, Ayalew S, Mohammed K. Modeling the determinants of time-to-age at first marriage in Ethiopian women: A comparison of various parametric shared frailty models. *Science Journal of Public Health*. 2015;3(5):707-718
- [6] Uddin ME. Age at first marriage for husband and wife between Muslim and Santal communities in rural Bangladesh: A cross-cultural perspective. *International Scholarly and Scientific Research & Invention*. 2009;3(7):674-681
- [7] Ikamari LDE. The effect of education on the timing of marriage in Kenya. *Demographic Research*. 2005;12(1):1-28
- [8] Amin A. Preventing violence against adolescent girls: What works? In: WHO Dept. of Reproductive Health and Research, Presented at 3rd International Day of the Girl Child Empowering Girls: Breaking the Cycle of Violence. Geneva: WHO; 2014
- [9] Field E, Ambrus A. Early marriage, age of menarche, and female schooling attainment in Bangladesh. *Journal of Political Economy*. 2008;116(5):881-930
- [10] Klugman J, Hanmer L, Twigg S, Hasan T, McCleary-Sills J. Voice and Agency: Empowering Women and Girls for Shared Prosperity. Washington, DC: The World Bank; 2014
- [11] Malhotra A, Warner A, McGonagle A, Lee-Rife S. Solutions to End Child Marriage What the Evidence Shows. Washington, DC: International Center for Research on Women; 2011
- [12] Nguyen MC, Wodon Q. Early marriage, pregnancies, and the gender gap in education attainment: An analysis based on the reasons for dropping out of school. In: Wodon Q, editor. *Child Marriage and Education in sub-Saharan Africa*. Washington, DC: World Bank; 2015
- [13] Parsons J, Edmeades J, Kes A, Petroni S, Sexton M, Wodon Q. Economic impacts of child marriage: A review of the literature. *The Review of Faith & International Affairs*. 2015;13(3):12-22
- [14] Vogelstein R. Ending Child Marriage: How Elevating the Status of Girls Advances U.S. Foreign Policy Objectives. New York: Council on Foreign Relations; 2013
- [15] United Nations Population Fund (UNFPA). State of the World Population 2013: Motherhood in Childhood: Facing the Challenge of Adolescent Pregnancy. New York: UNFPA; 2013
- [16] Walker JA, Mukisa S, Hashim Y, Ismail H. Mapping Early Marriage in West Africa. New York: Ford Foundation; 2013
- [17] Field E. Early Marriage and Female Schooling in Bangladesh, Preliminary and Incomplete (Unpublished). Harvard University; 2005

- [18] Klasen S, Pieters J. Push or Pull? Drivers of Female Labor Force Participation during India's Economic Boom. IZA discussion paper. 2012
- [19] Amin S. Female education and fertility in Bangladesh: The Influence of marriage and the family. In: Jeffery R, Basu A, editors. *Girl's Schooling, Women's Autonomy and Fertility Change in South Asia*. New Delhi, London and Newbury Park: Sage Publications; 1995
- [20] Jensen R, Thornton R. Early female marriage in the developing world. In: Sweetman C, editor. *Gender, Development and Marriage*. Oxford, UK: Oxfam GB; 2003
- [21] Kaufman GL, Meekers D. The impact of women's socioeconomic position on marriage patterns in sub-Saharan Africa. *Journal of Comparative Family Studies*. 1998;**29**(1):101-114
- [22] Lesthaeghe R, Kaufmann G, Meekers D. The nuptiality regimes in sub-Saharan Africa. In: Lesthaeghe R, editor. *Reproduction and Social Organisation in Sub-Saharan Africa*. Berkeley: University of California Press; 1989
- [23] Singh S, Samara R. Early marriage among women in developing countries. *International Family Planning Perspectives*. 1996;**22**:148-157
- [24] United Nations. Fertility behaviour in the context of development: Evidence from the world fertility survey. *Population Studies*. 1987;**(100)**:Sales No. E.86.XIII.5
- [25] United Nations. First Marriage: Patterns and Determinants. Department of International Economic and Social Affairs. New York: UN. ST/ESA/SER.R/76; 1988
- [26] Campbell JC. Health consequences of intimate partner violence. *The Lancet*. 2002;**359**(9314):1331-1336
- [27] Carbone-Lopez K, Kruttschnitt C, Macmillan R. Patterns of intimate partner violence and their associations with physical health, psychological distress, and substance use. *Public Health Reports*. 2006;**121**(4):382-392
- [28] Le Strat Y, Dubertret C, Le Foll B. Child marriage in the United States and its association with mental health in women. *Pediatrics*. 2011;**128** (3): 524-530
- [29] Nour NW. Child marriage: A silent health and human rights issue. *Review of Obstetric Gynecology*. 2009;**2**(1):51-56
- [30] Zahangir MS. Patterns in early and very early family formation in Bangladesh. *Asian Profile*. 2015;**43**(2): 123-140
- [31] UNICEF. The State of the World's Children 2016: A Fair Chance for Every Child. Division of Communication, UNICEF; 2016
- [32] Ahmed AU. Socioeconomic determinants of age at first marriage in Bangladesh. *Journal of Biosocial Science*. 1986;**18**:42-45
- [33] Arnab AT, Siraj MS. Child marriage in Bangladesh: Policy and ethics. *Bangladesh Journal of Bioethics*. 2020;**11** (1):24-34. DOI: 10.3329/bioethics.v11i1.49193
- [34] Bates LM, Maselko J, Schuler SR. Women's education and the timing of marriage and childbearing in the next generation: Evidence from rural Bangladesh. *Studies in Family Planning*. 2007;**38**(2):101-112
- [35] Biswas RK, Khan JR, Kabir E. Trend of child marriage in Bangladesh: A reflection on significant socioeconomic factors. *Children and Youth Services Review*. 2019;**104**:104382. DOI: 10.5772/intechopen.96264



- [36] Islam MM, Mahmud M. Marriage patterns and some issues related to adolescent marriage in Bangladesh. *Asia-Pacific Population Journal*. 1996;**11**(3):27-42
- [37] Islam MN, Ahmed AU. Age at first marriage and its determinants in Bangladesh (Demographers' Notebook). *Asia-Pacific Population Journal*. 1998;**13**(2):41-52
- [38] Kamal SMM, Hassan CH, Alam GM, Ying Y. Child marriage in Bangladesh: Trends and determinants *Journal of Biosocial Science*. 2014;**47**(1):1-20
- [39] Kamal SMM. Geographical variations and contextual effect on child marriage in Bangladesh. *Pakistan Journal of Women's Studies: Alam-e-Niswan*. 2010;**17**(2):37-57
- [40] Kamal SMM. Decline in child marriage and changes in its effect on reproductive outcomes in Bangladesh. *Journal of Health, Population and Nutrition*. 2012;**30**(3):317-330
- [41] Nahar MZ, Zahangir MS, Islam SMS. Age at first marriage and its relation to fertility in Bangladesh. *Chinese Journal of Population Resources and Environment*. 2013;**11**(3):227-235
- [42] Schuler SR, Bates LM, Islam F, Islam MK. The timing of marriage and childbearing among rural families in Bangladesh: Choosing between competing risks. *Social Science & Medicine*. 2006;**62**:2826-2837
- [43] Talukder A, Hasan MM, Razu SR, Hossain Z. Early marriage in Bangladesh: A cross-sectional study exploring the associated factors. *Journal of International Women's Studies*. 2020; **21**(1):68-78
- [44] Zahangir MS, Kamal MM. Several attributes linked with child marriage of females' in Bangladesh. *International Journal of Statistics and Systems*. 2011;**6**(1):107-117
- [45] Zahangir MS, Karim MA, Zaman MR, Hussain MI, Hossain MS. Determinants of age at first marriage of rural women in Bangladesh: A cohort analysis. *Trends Applied Science Research*. 2008;**4**(3):335-343
- [46] Mitra SN, Ali MN, Islam S, Cross AR, Saha T. Bangladesh Demographic and Health Survey, 1993–1994. Dhaka, Bangladesh, and Calverton, Maryland: National Institute of Population Research and Training (NIPORT), Mitra and Associates, and Macro International Inc.; 1994
- [47] Mitra SN, Al-Sabir A, Cross AR, Jamil K. Bangladesh Demographic and Health Survey, 1996–1997. Dhaka, Bangladesh, and Calverton, Maryland, USA: National Institute of Population Research and Training (NIPORT), Mitra and Associates, and Macro International Inc.; 1997
- [48] National Institute of Population Research and Training (NIPORT), Mitra and Associates, and ORC Macro. Bangladesh Demographic and Health Survey 1999-2000. Dhaka, Bangladesh, and Calverton, Maryland: NIPORT, Mitra and Associates, and ORC Macro; 2001
- [49] National Institute of Population Research and Training (NIPORT), Mitra and Associates, and ORC Macro. Bangladesh Demographic and Health Survey 2004. Dhaka, Bangladesh, and Calverton, Maryland: NIPORT, Mitra and Associates, and ORC Macro; 2005
- [50] National Institute of Population Research and Training (NIPORT), Mitra and Associates, and Macro International. Bangladesh Demographic and Health Survey 2007. Dhaka, Bangladesh, and Calverton, Maryland, USA: NIPORT, Mitra and Associates, and Macro International; 2009

- [51] National Institute of Population Research and Training (NIPORT), Mitra and Associates, and MEASURE DHS. Bangladesh Demographic and Health Survey 2011. Dhaka, Bangladesh, and ICF International, Calverton, Maryland, USA: NIPORT, Mitra and Associates, and MEASURE DHS;
- [52] National Institute of Population Research and Training (NIPORT), Mitra and Associates and The DHS Program. Bangladesh Demographic and Health Survey 2014. Dhaka, Bangladesh, and ICF International, Rockville, Maryland, USA: NIPORT, Mitra and Associates, and the DHS Program; 2016
- [53] Lee PA. Normal ages of pubertal events among American males and females. *Journal of Adolescent Health Care*. 1980;**1**(1):26-29
- [54] Nathan BM, Palmert MR. Regulation and disorders of pubertal timing. *Endocrinology and Metabolism Clinics of North America*, 2005;**34**: 617-641
- [55] Kamal SMM. Socioeconomic determinants of age at first marriage of the ethnic tribal women in Bangladesh; *Asian Population Studies*. 2011;**7**(1): 69-84
- [56] Aryal TR. Age at first marriage in Nepal: Differentials and determinants. *Journal of Biosocial Science*. 2007;**39**(5): 693-7
- [57] Gupta N, Mahy M. Adolescent childbearing in sub-Saharan Africa: Can increased schooling alone raise ages at first birth? *Demographic Research*. 2003;**8**(4):93-106
- [58] Male C, Wodon Q. Girls' education and child marriage in West and Central Africa: Trends, impacts, costs, and solutions. *Forum for Social Economics*. 2018;**47**(2):262-274. doi: 10.1080/07360932.2018.1451771.
- [59] Choe MK, Thapa S, Mishra V. Early marriage and early motherhood in Nepal. *Journal of Biosocial Science*. 2005;**37**(2):143-162
- [60] Westoff CF. Trends in Marriage and Early Childbearing in Developing Countries. DHS Comparative Reports No. 5. Calverton, MD, USA: Macro International Inc.; 2003
- [61] Wong OMH. The socioeconomic determinants of the age at first marriage among women in Hong Kong. *Journal of Family and Economic Issues*. 2005;**26**(4):529-550
- [62] Rahman MM, Hussain MI. Age at marriage of tribal women in Bangladesh: A case study. *Chittagong University Studies*. Part II: Science. 1997;**21**:73-80
- [63] Karim MA, Nahar MZ, Hossain MS. Rural-urban differentials of age at first marriage in Bangladesh. *The Chittagong University Journal of Science*. 2004;**28**(1):33-42
- [64] Efevbera Y, Bhabha J, Farmer P, Fink G. Girl child marriage, socioeconomic status, and undernutrition: Evidence from 35 countries in Sub-Saharan Africa. *BMC Medicine*. 2019;**17**:55